

**REMARKS**

Entry of the foregoing, re-examination and reconsideration of the subject matter identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.116, and in light of the remarks which follow, are respectfully requested.

Claim 1 has been canceled and replaced by new claim 34. Claims 5, 16 and 17 have also been canceled without prejudice or disclaimer. Claims 2-4, 6-15 and 18-34 are now pending in this application.

Claims 1-33 were finally rejected under 35 U.S.C. §103(a) as unpatentable over Kildemo et al., "Real time control of the growth of silicon alloy multilayers by multiwavelength ellipsometry" (Thin Solid Films, Vol. 290-291; Dec. 1996; pages 46-50) in view of M. Kildemo et al., "A direct robust feedback method for growth control of optical coatings by multiwavelength ellipsometry" (Thin Solid Films, Vol. 313-314; Dec. 1998; pages 484-489) for the reasons set forth on pages 2-6 of the Office Action. Reconsideration of this rejection is respectfully requested in view of the above amendments and for at least the reasons which follow.

The presently claimed invention relates to a method for controlling in real time, the fabrication of thin film structures such as multilayered optical filters and semiconductor components by techniques such as vapor deposition. The claimed method employs real-time ellipsometric measurements to monitor physical parameters relevant to a layer that is being grown on a substrate. Specifically, the ellipsometer measures at any time the variables  $I_s$  and  $I_c$  which are formally equivalent to the better known ellipsometric angles  $\Psi$  and  $\Delta$ , but present advantages for the practical calculations of data. The growth process is characterized by a trajectory in the  $(I_s, I_c)$  plane representing the locus of the continuum of the

successive states of the structure being formed, from the bare substrate to the final coated structure. The trajectories appear as a series of curves, separated by angular points corresponding to the change in deposited material when switching from one layer to the next.

In the presently claimed method, the length of the trajectories traveling in the plane of the variables  $I_s$  and  $I_c$  is measured and compared with the length of the theoretical trajectories of a desired structure. The growth of a given layer is terminated when the length of the measured trajectory is equal to that of the theoretical one.

Applicants have previously detailed the respective disclosures of the Kildemo et al. articles and the distinctions between the combined disclosures thereof and the presently claimed methods. Note pages 3-6 of the Response filed November 3, 2003. It is respectfully submitted that the cited prior art does not disclose or suggest the methods of the invention.

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In response to the helpful comments made by Examiner Ortiz-Rodriguez on page 6 of the Final Rejection, Applicants have replaced claim 1 with new claim 34. Claim 34 recites the step of reflecting a polarized light beam from a surface of a structure, specifies that the variables being measured are  $I_s$  and  $I_c$ , specifies that the trajectory of the variables measured (i.e., experimental trajectory) is compared with the theoretical trajectory, and indicates that the comparison involves comparing the length of the path traveled by the polarized light beam at a time  $t$  in the plane of the variables with respect to an initial point at time  $t_0$  for each layer in the thin film structure. The description of the variables was obtained from claims 5, 16 and 17.

The step of using a reflected beam of polarized light is disclosed in the specification on page 1, line 36 to page 2, line 2.

Applicants respectfully submit that claim 34 and the dependent claims clearly define a method which is not disclosed or suggested by combining the disclosures of the Kildemo et al. documents. Accordingly, the §103(a) rejection should be withdrawn in view of the amendments and arguments. Such action is earnestly requested.

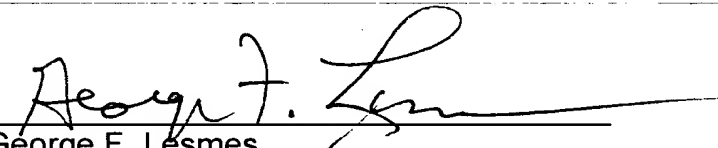
From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order and such action is earnestly solicited. If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned at (703) 838-6683 at his earliest convenience.

Respectfully submitted,

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